AMENDMENT TO THE CLAIMS

Please amend the claims as follows:

Claims 1-15 (Canceled).

16. (Currently Amended) A method comprising:

obtaining a plurality of images of a measured fluorescence intensity decay for a sample having been exposed to an excitation pulse generated by an excitation light source, the measured fluorescence intensity decay being associated with a fluorescence decay function and/or a fluorescence impulse response function;

~~deconvolving the excitation pulse from the measured fluorescence intensity delay;~~

expanding the fluorescence decay function and/or the fluorescence impulse response function on a Laguerre basis;

estimating ~~a first expansion coefficient ("$\{c_0\}$") of~~ a plurality of expansion coefficients ("$\{c_j\}$") within the Laguerre basis at each pixel of a plurality of pixels in ~~an~~ the images ~~and computing a map of the first expansion coefficient ("$\{c_0\}$")~~;

generating a map of ~~the higher expansion coefficients~~ each of the plurality of expansion coefficients ("$\{c_j\}$"); and

computing a map of average lifetimes by constructing an impulse response function ("IRF") at every pixel for a predetermined number of time instances ("S") and interpolating a time point at which the IRF becomes 1/e of its maximum value, wherein the IRF is represented by the equation:

$$h(r,n) = \sum_{j=0}^{L-1} c_j(r) \cdot b_j^a(n), n = 0,1,...,S-1$$

17. (Original) The method of claim 16, wherein the sample is selected from the group consisting of a biological tissue, a chemical, a biochemical sample and combinations thereof.

18. (Original) The method of claim 16, further including detecting a physiological

condition from the group consisting of a tumor and an atherosclerotic plaque.

19. (Original) The method of claim 16, further including predicting the distribution of concentration of at least one biochemical component of the sample images, wherein the sample is composed of a plurality of biochemical components.

20. (Original) The method of claim 16, further including monitoring an intracellular component and an activity of the intracellular component.

21. (Original) The method of claim 16, further including identifying a chemical with a biological activity for automated screening of the sample for new drugs discovery.

22. (Previously Presented) The method of claim 21, further configured to characterize drugs based on their chemical composition so high speed/throughput surveying and counting of the drugs is possible.

23. (Previously Presented) The method of claim 21, further configured to characterize a biochemical essay based on biochemical contents to facilitate high speed/throughput surveying/analysis of the essay.

24. (Original) The method of claim 16, further including sequencing a deoxyribonucleic acid (DNA) microarray.

Claims 25-44 (Canceled).